SESSION #1

MODELING & SIMULATION SOLUTIONS FOR TRAINING

ISSUE

Meeting Air Force training needs is becoming increasingly difficult, given our advanced air and space systems, reduced training budgets, political and environmental constraints, and the need for combined/joint interoperability. Advances in simulation technology may provide many solutions, but advanced training capabilities for new systems must be designed in and acquired up front.

BACKGROUND

- In February 1996, CSAF tasked XO to lead an effort to ensure the Air Force meets its future training needs by specifically addressing the following questions:
  - How will our future training environment affect our philosophy on how we train?
  - How can we best leverage simulator technologies and related database, network, and environment technologies to meet this future training philosophy?
  - What is the appropriate interaction between major weapon systems (including training assets such as simulators) and the joint synthetic training environment (including exercise support simulation and range management)?
  - Can we orchestrate Air Force training and simulation technology developments to enable combat Air Force training assets to function in a Joint Synthetic Battlespace with the full range of tactical assets available to the Joint Task Force Commander?
- The CSAF subsequently designated AF/XOM the single focal point for Distributed Mission Training (DMT), which includes crew training devices, databases, infrastructure, networked environments, standards and protocols, architectures, and supporting models. AF/XOM was tasked to build a comprehensive, executable plan to revolutionize Air Force crew-level training in a joint synthetic environment. The plan will include developing and testing integrated DMT environments to support full mission training.
- AF/XOM has developed a draft concept for Revolutionizing Training and is in the process of collecting inputs from around the Air Force to further refine the effort. Revolutionize Training focuses on providing mission proficiency to the warfighter: Air Combat Team - Airborne Weapons Controllers, Satellite Console Operators, Flightline Crew Chiefs, Pilots, Air Operations Center Staff members, Logisticians, Acquisitioners, etc..
- The Draft Report of Audit, Simulators for Mature Weapons Systems (Air Force Audit Agency Project 95064034) makes several recommendations regarding simulator procurement. AF/XO is analyzing the recommendation to establish an Air Staff-level focal point for simulator-unique budget issues. The results of this analysis will be released 1 Nov 96, and will present recommendations for implementation.

DISCUSSION

Recognizing that there is an ongoing technology effort aimed at developing networked air combat synthetic environments that allow unconstrained training of wartime skills, several other noteworthy initiatives are designed to enable Revolutionizing Training:

- Embedded training (ET) programs such as the On Board Electronic Warfare System (OBEWS) hold potential for the future. It is imperative that operators train on the same equipment they will employ in conflict, when possible. ET systems use threat simulators on live ranges to activate threat warning devices on aircraft for practicing tactics, techniques, and procedures. Future applications could employ Global Positioning Satellite technologies to resolve aircraft position, thereby eliminating the need for instrumented ranges for threat training.
  - ET systems are flexible, deployable, and provide the opportunity for just-in-time training.
  - On the down side, placing ET systems aboard the current operational inventory can increase aircraft weight, degrade performance, and jeopardize inflight safety. If new systems are designed to include ET from the initial concept, these problems can be minimized or eliminated.
- Advanced Distributed Simulation (ADS) provides the greatest opportunity in providing routine, on-demand full mission training. Simulators are generally cost effective training devices, as compared to aircraft flight time. Advanced Distributed Simulation will permit full mission training for whole portions of the Air Combat Team. The conceptual approach is to fulfill command and control, mission, and system training using ADS. By blending simulators and constructive computer generated elements in a synthetic training environment, it is possible to engage in full mission training. Acquiring Modeling and Simulation (M&S) technologies such as ADS to complement ET or serve as an alternative to ET will reduce costs and improve realism beyond existing systems.
- The Air Force Battle Lab will use a scaleable, robust communications architecture, real warriors, real world equipment and databases, and constructive and virtual simulations to create a synthetic environment to provide
  - Joint Air Operations Center (JAOC) "sensors to JFACC team to shooter" C2 training
  - Provide a platform to evaluate new technologies for future system insertion
  - Allow for refinement of employment CONOPS for real-world use

  Operational testbeds such as the Advanced Concept Enhanced Simulation (ACES) are central to achieving the capability for routine, on-demand distributed mission training. The ACES concept is multi-MAJCOM supported effort seeking to bring the acquisition, research, and operational communities together to further advance simulator technologies.

RECOMMENDATION

Require Embedded Training analysis for all new systems.